

What is claimed is::

1. An optical filter comprising:
 - a. an organic, solar blind filter dye; and
 - b. a UV-transparent, non-scattering and chemically stable substrate.
2. The filter of claim 1 wherein said filter dye is a cyanine dye.
3. The filter of claim 1 wherein said filter dye is a cyclic cyanine dye.
4. The filter of claim 1 wherein said filter dye is a 2,7-dialkyl-3,6-diazacyclohepta-1,6-diene complexed with a counterion.
5. The filter of claim 1 wherein said filter dye is 2,7-dimethyl-3,6-diazacyclohepta-1,6-diene perchlorate.
6. The filter of claim 1 wherein said filter dye is salt of a dithioic acid having the formula RCS_2X^+ , wherein R is H or alkyl and X is a cation.
7. The filter of claim 6 wherein the alkyl group is a methyl, ethyl, isopropyl or tertiary butyl group, and the cation X is selected from the group consisting of Na^+ , $\text{N}(\text{C}_2\text{H}_5)_4^+$ and $\text{C}_5\text{H}_{10}\text{NH}_2^+$ (piperidine).
8. The filter of claim 1 wherein said substrate is a UV-transparent nanoporous silica glass solid having pores that are substantially filled with a UV-transparent solvent, said solvent being selected to dissolve said dye and also to match the refractive index of the nanoporous silica glass solid.
9. The filter of claim 8 wherein said solvent comprises dibutyl phthalate or dibutyl succinate.

1 10. The filter of claim 1 wherein said substrate comprises a UV-transparent inorganic salt
2 compressed to form a solid body.

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4 11. The filter of claim 10 wherein said inorganic salt is a halide salt of an alkali metal (Group
5 1a) or an alkaline earth metal (Group 2a).

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7 12. The filter of claim 11 wherein said halide salt is a fluoride, chloride, bromide or iodide
8 salt.

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10 13. The filter of claim 11 wherein said alkali metal is K or Cs, and said alkali earth metal is
11 Ca.

12
13 14. The filter of claim 1 wherein said filter absorbs UV radiation having wavelengths
14 between about 300 and 400 nm, and transmits UV radiation having a wavelength below about
15 300 nm.

16
17 15. A method of making an optical filter comprising:

18 a. an organic, solar blind filter dye; and

19 b. a UV-transparent, non-scattering and chemically stable substrate,

20 comprising the steps of:

21 (1) selecting a nanoporous silica glass solid that is substantially UV-
22 transparent;

23 (2) dissolving said dye in a UV-transparent solvent, which has been selected
24 to form a solution of said dye and to match the refractive index of the
25 nanoporous silica glass solid;

26 (3) allowing said solution to permeate said porous glass solid to form a UV-
27 transparent, non-scattering substrate incorporating said dye.

28
29 16. The method of claim 16 wherein said UV-transparent solvent comprises dibutyl phthalate
30 or dibutyl succinate.

17. A method of making an optical filter comprising:

- a. an organic, solar blind filter dye; and
- b. a UV-transparent, non-scattering and chemically stable substrate,

comprising the steps of:

- (1) selecting a nanoporous silica glass solid that is substantially UV-transparent;
- (2) dissolving said dye in a relatively volatile solvent to form a volatile solution;
- (3) allowing said volatile solution to permeate said nanoporous glass solid;
- (4) evaporating off the relatively volatile solvent, leaving behind microparticles of said dye in the pores of the nanoporous silica glass solid; and
- (5) allowing a relatively non-volatile, UV-transparent solvent, which has been selected to match the refractive index of the nanoporous glass solid, to permeate the nanoporous glass solid containing microparticles of said dye until said dye is dissolved in the non-volatile solvent, thus forming a UV-transparent, non-scattering substrate incorporating said dye.

18. The method of claim 17 wherein said relatively volatile solvent is an alkanol, a halogenated hydrocarbon or water.

19. The method of claim 17 wherein said non-volatile, UV-transparent solvent comprises dibutyl phthalate or dibutyl succinate.

20. A method of making an optical filter comprising:

- a. an organic, solar blind filter dye; and
- b. a UV-transparent, non-scattering and chemically stable substrate,

comprising the steps of:

- (1) grinding together a UV-transparent inorganic salt with said dye to form a mixture;
- (2) compressing said mixture to form a solid body.

1 21. The method of claim 20 wherein said UV-transparent inorganic salt is a halide salt of an
2 alkali metal (Group 1a) or an alkaline earth metal (Group 2a).

3
4 22. The method of claim 20 wherein said inorganic salt is the fluoride, chloride, bromide or
5 iodide salt of K, Cs or Ca.

6
7 23. The method of claim 20 wherein said compressing step takes place at a pressure ranging
8 from about 10,000 psi to about 50,000 psi.

9
10 24. The method of claim 20 wherein said method further comprises the step of coating the
11 solid body with a sealant to ensure chemical and dimensional stability.

12 25. An optical device comprising a optical filter, said filter comprising:

- 13 a. an organic, solar blind filter dye; and
14 b. a UV-transparent, non-scattering and chemically stable substrate.
15
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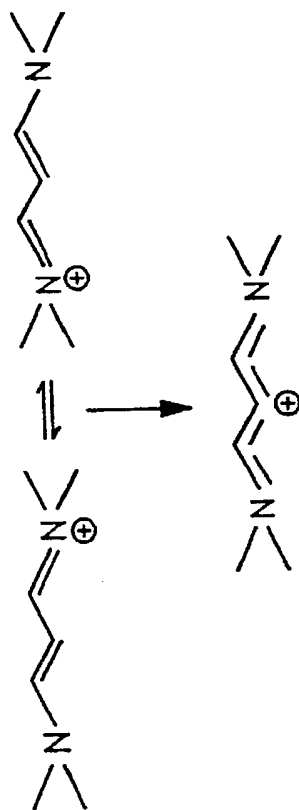


FIG. 4A

Cyanides

FIG. 4B

$\lambda_{\max} = 325 \text{ nm}$

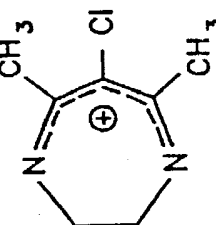
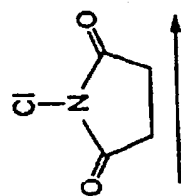
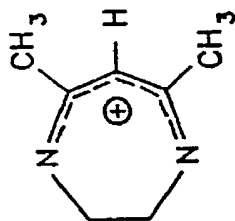


FIG. 4C

$\lambda_{\max} = 346 \text{ nm}$

